IN THE CLAIMS

1. (currently amended) A method comprising:

detecting components of plaque using a multi-energy computed tomography (MECT) system, wherein said detecting the components of the plaque includes generating a look-up table by using at least one ~~phantom.~~phantom; and

quantifying the components of the plaque by determining a weighted sum of densities of pixels of an image of an organ including the plaque.

2. (previously presented) A method in accordance with Claim 1 wherein the phantom includes a simulated phantom, said method comprising:

obtaining the components of the plaque by using the generated look-up table, wherein said generating the look-up table includes producing the look-up table by using the simulated phantom, wherein the look-up table maps different densities of a selected basis material of the simulated phantom to projection data for different energy spectra.

3. (previously presented) A method in accordance with Claim 2 wherein said generating the look-up table comprises:

obtaining first and second sets of projection data of the simulated phantom with a set of known material properties by:

placing the simulated phantom in a scanning field of the MECT system; and

scanning the simulated phantom at first and second energy spectra using the MECT system.

4. (previously presented) A method in accordance with Claim 3 wherein said obtaining the components of the plaque comprises:

placing an object in the scanning field of the MECT system;

scanning the object at the first and second energy spectra using the MECT system to obtain projection data of the object; and

enabling, utilizing the look-up table, a reconstruction of images of a distribution of densities of the object by reversely mapping the projection data of the object to densities of the selected basis material, wherein the selected basis material includes at least one of iodine and water.

5. (previously presented) A method in accordance with Claim 1 wherein said generating the look-up table comprises:

obtaining projection data of the phantom with a set of known material properties by:

placing the phantom in a scanning field of the MECT system;

scanning the phantom using the MECT system;

counting photons generated from the scan; and

distinguishing the photons based on an energy threshold.

6. (previously presented) A method in accordance with Claim 5 wherein said obtaining the components of the plaque comprises:

placing an object in the scanning field of the MECT system;

scanning the object using the MECT system to obtain projection data of the object; and

enabling, utilizing the look-up table, a reconstruction of images of a distribution of densities of the object by reversely mapping the projection data of the object to densities of the selected basis material, wherein the selected basis material includes at least one of iodine and water.

7. (previously presented) A method in accordance with Claim 1 further comprising:

performing additional scans of an object at different times; and

repeating said detecting the components of the plaque.

8. (original) A method in accordance with Claim 1 further comprising:

administering a contrast agent in at least one of lipid-avid agents, plaque specific antigens, and plaque cells; and

repeating said detecting the components of the plaque.

9. (original) A method in accordance with Claim 1 further comprising:

administering a temperature-sensitive contrast agent in an inflamed plaque; and

repeating said detecting the components of the plaque.

10. (canceled)

11. (currently amended) A method in accordance with ~~Claim 10~~Claim 1 wherein said quantifying the components of the plaque comprises:

calculating composition distributions of the plaque; and

calculating total plaque burden.

12. (previously presented) A method in accordance with Claim 1 further comprising:

displaying at least one of a 2-dimensional (2D) and a 3-dimensional (3D) image of the components of the plaque on a wall of an organ of an object; and

viewing, from a viewpoint, a volume of the plaque in the 3D image.

13. (original) A method in accordance with Claim 1 further comprising:

improving quality of images of an object having at least one of metal stents and valves by removing beam-hardening artifacts in the images; and

enabling visualization of restenosis within at least one of the metal stents by repeating said detecting the components of plaque.

14. (currently amended) A method for detecting components of plaque comprising:

generating information regarding projection data of phantoms by using a multi-energy computed tomography (MECT) system;

generating a look-up table by using one of the ~~phantoms; and~~phantoms;

obtaining the components of the plaque from the ~~information.~~information; and

enabling visualization of restenosis within one of a metal stent and a metal valve by repeating said obtaining the components of plaque after scanning a patient having the one of the metal stent and the metal valve.

15. (currently amended) A multi-energy computed tomography (MECT) system comprising:

at least one radiation source configured to transmit x-rays that intersect an object;

at least one detector configured to detect the x-rays;

a controller coupled to the detector; and

a computer configured to:

instruct the MECT system to detect components of ~~plaque; and~~plaque;

generate a look-up table by using at least one ~~phantom.~~phantom;

repeat the detection of the components of the plaque after instructing a user to administer a temperature-sensitive contrast agent to accentuate a visualization of the plaque.

16. (previously presented) An MECT system in accordance with Claim 15, wherein the at least one phantom includes a simulated phantom, and to detect the components of the plaque, said computer is configured to:

produce the look-up table by using the simulated phantom, wherein the look-up table maps different densities of a selected basis material of the phantom to projection data for different energy spectra; and

obtain the components of the plaque by using the look-up table.

17. (previously presented) An MECT system in accordance with Claim 16, wherein to generate the look-up table, said computer is configured to:

obtain first and second sets of density distribution images of the simulated phantom with a set of known material properties by:

simulating placement of the simulated phantom in a scanning field of the MECT system; and

simulating a scan of the simulated phantom at first and second energy levels using the MECT system.

18. (previously presented) An MECT system in accordance with Claim 17, wherein to obtain the components of the plaque, said computer is configured to:

instruct the MECT system to place an object in the scanning field of the MECT system;

instruct the MECT system to scan the object at the first and second energy levels to obtain projection data of the object; and

determine, from the look-up table, densities of the object by reversely mapping the projection data of the object to the densities of the selected basis material, wherein the selected basis material includes at least one of iodine and water.

19. (original) An MECT system in accordance with Claim 15 wherein said computer is configured to:

instruct the MECT system to perform additional scans of the object at different times; and

repeat the detection of the components of the plaque.

20. (original) An MECT system in accordance with Claim 15 wherein said computer is configured to:

instruct a user to administer a contrast agent in at least one of lipid-avid agents of the plaque, plaque specific antigens of the plaque, and plaque cells of the plaque; and

repeat the detection of the components of the plaque.

21. (currently amended) An MECT system in accordance with Claim 15 wherein said computer is ~~configured to:~~configured to instruct ~~a user~~the user to administer ~~a temperature sensitive~~the temperature-sensitive contrast agent in an inflamed plaque~~; and~~

~~repeat the detection of the components of the plaque~~.

22. (canceled)

23. (currently amended) An MECT system in accordance with ~~Claim 22~~Claim 15, wherein to quantify the components of the plaque, said computer is configured to:

calculate composition distributions of the plaque; and

calculate total plaque burden.

24. (original) An MECT system in accordance with Claim 15 wherein said computer is configured to:

instruct a display device to display at least one of a 2-dimensional (2D) and a 3-dimensional (3D) image of the components of the plaque on a wall of an organ of the object; and

enable viewing, from a viewpoint, a volume of the plaque in the 3D image.

25. (previously presented) An MECT system in accordance with Claim 15, wherein said computer is configured to:

improve quality of images of an object having at least one of metal stents and valves by removing beam-hardening artifacts in the images; and

enable visualization of restenosis within at least one of the metal stents by repeating said detecting the components of plaque.

26. (currently amended) A computer readable medium encoded with a program configured to instruct a computer to detect components of plaque within an object that is scanned using a multi-energy tomography (MECT) system, the program further configured to instruct the computer to generate, by using at least one phantom, a look-up table that maps different densities of a selected basis material of the phantom to projection data for different energy spectra, and to repeat the detection of the components of the plaque after instructing a user to administer a contrast agent to accentuate a visualization of the plaque.

27. (currently amended) A computer encoded with a program configured to instruct an MECT system to detect components of plaque within an object that is scanned using the MECT system, the program further configured to instruct the computer to generate, by using at least one phantom, a look-up table that maps different densities of a selected basis material of the phantom to projection data for different energy spectra, and to quantify the components of the plaque by determining a weighted sum of densities, greater than a specific amount, of pixels of an image of an organ including the plaque.